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Time Analysis for Project 2

Points within a Circle

|  |  |  |  |
| --- | --- | --- | --- |
| n\* | Running Time | | |
| Graham Scan | Jarvis March | Quickhull |
| 10 | 0 | 0 | 0 |
| 100 | 0 | 0 | 0 |
| 1,000 | 0 | 0 | 0 |
| 10,000 | 7 | 2 | 13 |
| 100,000 | 61 | 51 | 237 |
| 1,000,000 | 516 | 788 | 3650 |
| 2,000,000 | 1005 | 1670 | 7702 |
| 4,000,000 | 2009 | 3551 | 16530 |
| 8,000,000 | 4171 | 8679 | 40654 |

Graph?

Points on a Circle

|  |  |  |  |
| --- | --- | --- | --- |
| n\* | Running Time | | |
| Graham Scan | Jarvis March | Quickhull |
| 10 | 0 | 0 | 0 |
| 100 | 0 | 0 | 0 |
| 1,000 | 0 | 1 | 6 |
| 10,000 | 3 | 20 | 62 |
| 100,000 | 32 | 184 | 599 |
| 1,000,000 | 289 | 1854 | 6141 |
| 2,000,000 | 599 | 3645 | 12210 |
| 4,000,000 | 1149 | 7848 | 23827 |
| 8,000,000 | 2325 | 14939 | 47820 |

Graph?

Points within a Rectangle

|  |  |  |  |
| --- | --- | --- | --- |
| n\* | Running Time | | |
| Graham Scan | Jarvis March | Quickhull |
| 10 | 0 | 0 | 0 |
| 100 | 0 | 0 | 0 |
| 1,000 | 0 | 0 | 0 |
| 10,000 | 6 | 2 | 7 |
| 100,000 | 68 | 18 | 37 |
| 1,000,000 | 544 | 177 | 292 |
| 2,000,000 | 1040 | 377 | 484 |
| 4,000,000 | 2048 | 1325 | 990 |
| 8,000,000 | 4039 | 1977 | 2020 |

Graph?

Points within a Triangle

|  |  |  |  |
| --- | --- | --- | --- |
| n\* | Running Time | | |
| Graham Scan | Jarvis March | Quickhull |
| 10 | 0 | 0 | 0 |
| 100 | 0 | 0 | 0 |
| 1,000 | 0 | 0 | 0 |
| 10,000 | 6 | 0 | 3 |
| 100,000 | 56 | 11 | 41 |
| 1,000,000 | 538 | 99 | 106 |
| 2,000,000 | 1057 | 188 | 213 |
| 4,000,000 | 2205 | 145 | 426 |
| 8,000,000 | 4333 | 483 | 842 |

Graph?

Asymptotic Time Complexity

|  |  |  |  |
| --- | --- | --- | --- |
|  | Running Time | | |
| Graham Scan | Jarvis March | Quickhull |
| Best Case |  |  |  |
| Average Case |  |  |  |
| Worst Case |  |  |  |

Does my empirical analysis match my theoretical analysis?

To do